CLAIMS

1.   A search key construction system, comprising:

a plurality of search key sections, wherein each section is coupled to an output of a first multiplexer having a first programmable control;

a second multiplexer having a second programmable control and an output coupled to the first multiplexer; and

a third multiplexer having a third programmable control and an output coupled to the first multiplexer.

2.   The search key construction system of claim 1, wherein:

the plurality of search key sections is configured to substantially form a search key for a memory bank.

3.   The search key construction system of claim 1, wherein:

the first programmable control includes a key source select configured to enable one of a first type path, a second type path, and a third type path.

4.   The search key construction system of claim 3, wherein:

the first type path includes one of a plurality of designated section positions from a packet header.

5.   The search key construction system of claim 3, wherein:

the second type path includes a short field from a packet attribute.

6.   The search key construction system of claim 5, wherein:

the short field includes a width of at most 16-bits.

7.   The search key construction system of claim 3, wherein:

the third type path includes a long field from a packet header.

8.   The search key construction system of claim 7, wherein:

the long field includes a width of at least 128-bits.

9. The search key construction system of claim 1, wherein:
   the second programmable control includes a short field selection signal.

10. The search key construction system of claim 1, wherein:
    the third programmable control includes a long field selection signal.

11. The search key construction system of claim 1, wherein:
    each of the plurality of search key sections is 16-bits wide.

12. The search key construction system of claim 2, wherein:
    the memory bank includes Ternary Content Addressable Memory (TCAM).

13. The search key construction system of claim 2, wherein:
    the memory bank includes Static Random Access Memory (SRAM).

14. A method of constructing a search key, comprising the steps of:
    programming bank key construction settings;
    passing a first type programmed field to a key section if a first type path is enabled;
    passing a second type programmed field to the key section if a second type path is
    enabled;
and
    passing a third type field to the key section if the first type path and the second type path
are both disabled.

15. The method of constructing a search key of claim 14, wherein:
    the first type path includes a long field from a packet header.

16. The method of constructing a search key of claim 14, wherein:
    the second type path includes a short field from a packet attribute.

17. The method of constructing a search key of claim 14, wherein:
    the third type field includes one of a plurality of designated section positions from a
packet header.

18.   A means for constructing a search key, comprising:

a means for programming bank key construction settings;

a means for passing a first type programmed field to a key section if a first type path is

enabled;

a means for passing a second type programmed field to the key section if a second type

path

is enabled; and

a means for passing a third type field to the key section if the first type path and the

second type path are both disabled.

19.   A hierarchical key construction system, comprising:

a plurality of search key sections, wherein the sections are substantially provided by:

(a) a first selection level having first fields;

(b) a second selection level having second fields; and

(c) a third selection level having third fields.

20.   The hierarchical key construction system of claim 19, wherein:

the first fields include a predefined group of fields.

21.   The hierarchical key construction system of claim 20, wherein:

the first selection level includes one multiplexer configured to provide the predefined

group of fields to the plurality of search key sections.

22.   The hierarchical key construction system of claim 21, wherein:

the plurality of search key sections is configured to substantially form a search key for a

memory bank.

23.   The hierarchical key construction system of claim 19, wherein:

the first fields each have a first width;

the second fields each have a second width; and

the second width is substantially less than the first width.

24.   The hierarchical key construction system of claim 23, wherein:

the second selection level includes a plurality of multiplexers, each multiplexer configured to provide a selected second field to a corresponding one of the plurality of search key sections.

25.   The hierarchical key construction system of claim 24, wherein:

the selected second field is configured to replace the first fields in the corresponding one of the plurality of search key sections.

26.   The hierarchical key construction system of claim 19, wherein:

the third fields include programmable user fields.

27.   The hierarchical key construction system of claim 26, wherein:

the third selection level is configured to provide a selected one of the programmable user fields to the plurality of search keys sections.

28.   The hierarchical key construction system of claim 27, wherein:

the plurality of search key sections is configured to substantially form a search key for a memory bank.

29.   The hierarchical key construction system of claim 28, further comprising:

a plurality of the search keys corresponding to a plurality of the memory banks.